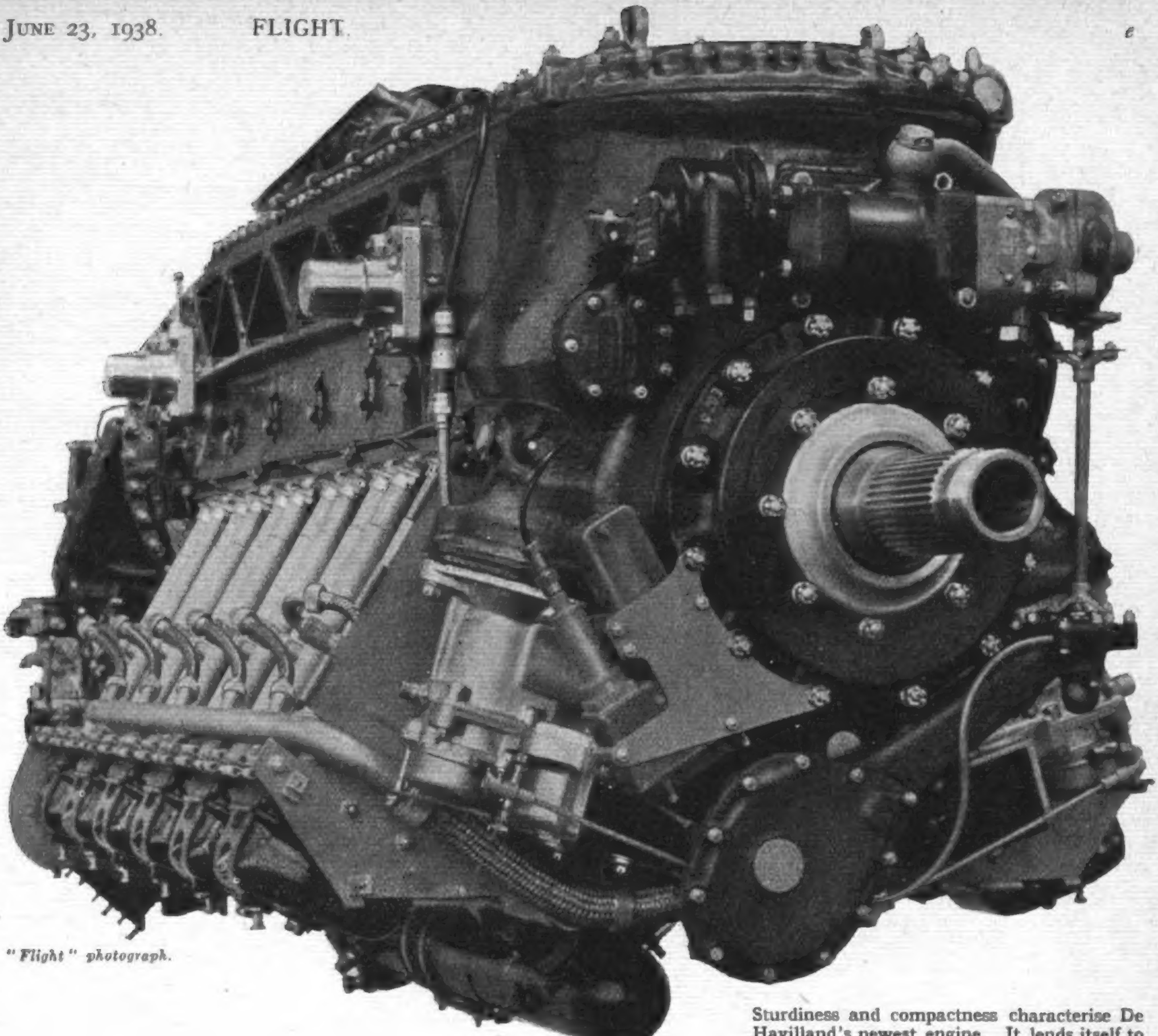
"Flight" photograph.

Sturdiness and compactness characterise De Havilland's newest engine. It lends itself to a cowling of circular cross-section.

AN INVERTED VEE-TWELVE

The De Havilland Gipsy Twelve Described in Detail: Small Frontal Area: 525 h.p. for Take-off with Constant-speed Airscrew

THE first inverted Vee-twelve air-cooled engine in the world to pass into production is the De Havilland Gipsy Twelve designed by Major Frank B. Halford.

Though units of similar layout have been under development for some years in France, and more lately in America and Italy, none appears to have been selected as standard equipment for a commercial or military machine, whereas the Gipsy Twelve is specified not only for the long-range and standard versions of the Albatross airliner, but for the Don advanced trainer and communications machine now being supplied to the R.A.F.

It may be as well to explain here that, as used in the Don, the engine is known as the Gipsyking I, being fitted with auxiliaries to Air Ministry specification. Essentially the Gipsyking is exactly similar to the civil unit.

Being intended for use in high-speed commercial and military machines, the engine is geared and supercharged and has been designed for use with a De Havilland constant-speed airscrew. Though the capacity is precisely double that of the Gipsy Six (the actual figure is 18.372 litres), it develops more than two and a half times the power, the take-off output being 525 h.p. Several components are interchangeable with those on the Series II versions of the Gipsy Major and Gipsy Six.

Comparisons of engine weight should, of course, be related to thrust h.p. while cruising and at take-off. The installed weight of the Gipsy Twelve, it is claimed, is comparable with other engine types in current use.

The engine lends itself to a cowling of circular cross-section and one having a diameter which is low, not only in relation to the power delivered, but to the diameter of the airscrew. This means high propulsive efficiency under cruising conditions and improved take-off thrust. It is explained by the manufacturers that at speeds over 200 m.p.h. the factors of frontal area, diameter and clean entry assume an importance of the first order in the efficient use of power as reflected in speed, range and payload and in the resultant figure of payload ton/miles per gallon of fuel. Commercial economy has, of course, always characterised De Havilland engines.

To ensure that the clean entry may not be impaired by an air scoop for the cooling air a special cooling system has been evolved. This was explained at some length in *Flight* of March 31, but it may be as well to recall the salient features. Ducts are incorporated in the leading edge of the wing and deliver air at controlled pressure and rate of flow from the rear of the engine, being exhausted downward and rearward through a gill on the underside of the nacelle. In the fully open position, this gill induces a suction which assists the slip stream pressure in forcing air over the engine. The orifices in the leading edge of the wing are located approximately at three-quarters the